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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

EXAMINER

LAVARIAS, ARNEL C

ART UNIT PAPER NUMBER

2872

DATE MAILED: 02/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/992,849

Applicant(s)

TABINY ET AL.

Examiner

Arnel C. Lavarias

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 20-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19, 27-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-19, 27-29, drawn to a lamellar diffraction grating and a wavelength router including the above lamellar diffraction grating, classified in Class 359, subclass 569.
 - II. Claims 20-26, drawn to a method for fabricating a lamellar diffraction grating, classified in Class 216, subclass 24.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the lamellar diffraction grating can be made by a materially different process, such as by ruling/scribing or by thin film deposition.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

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5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.
6. During a telephone conversation with Patrick M. Boucher (303-571-4000) on 1/27/03, a provisional election was made with traverse to prosecute the invention of a lamellar diffraction grating and a wavelength router including the above lamellar diffraction grating (Invention I), Claims 1-19, 27-29. Affirmation of this election must be made by applicant in replying to this Office action. Claims 20-26 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.
7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

8. The drawings are objected to because of the following informality:

✓ Figure 5A- '20' should read '520'.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

9. The disclosure is objected to because of the following informalities:

- ✓ Page 5, line 33- ' h/a 0.35' is unclear as there is a mathematical sign missing
- ✓ Page 11, line 7- insert 'now U.S. Patent No. 6501877 and' after '09/442,061,'.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1-2, 5, 8-10, 13, and 16-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Kleeman et al.

Kleeman et al. discloses a lamellar reflection diffraction grating (See Figure 1; paragraphs 0027-0050) comprising a substrate (See 2 in Figure 1); and an arrangement of generally rectangular protrusions (See 3 in Figure 1) spaced along the substrate such that $h/a > 0.5$, and more specifically between 0.84 and 0.96, and $w/a < 0.5$, and more specifically between 0.15 and 0.30 (See paragraphs 0031-0037). Kleeman additionally discloses the generally rectangular protrusions having substantially equal heights and widths, and the widths of each protrusion being defined by the FWHM measurement of a profile of such protrusion (See Figure 1).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 3-4, 6-7, 11-12, 14-15, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kleeman et al.

With regard to Claims 3-4, 11-12, and 18, Kleeman et al. discloses the invention as set forth above in Claims 1, 9, and 17, except for the grating period corresponding to a line density between 800 and 1000 protrusions/mm. It would have been obvious to one having ordinary skill in the art to adjust the grating period from that disclosed by Kleeman et al. (i.e. approximately 3300 protrusions/mm based on the width d as defined in Figure 1) to correspond to a line density between 800 and 1000 protrusions/mm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to adjust the grating period to correspond to a line density between 800 and 1000 protrusions/mm for the purpose of adjusting the dispersion of the diffraction grating, based on the intended application. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235.

With regard to Claims 6-7, 14-15, and 19, Kleeman et al. discloses the invention as set forth above in Claims 1, 9, and 17, except for w/a being between 0.22 and 0.30. It would have been obvious to one having ordinary skill in the art to adjust either a or w (w/a is

approximately 0.10 to 0.168 in Kleeman et al.) such that w/a is between 0.22 and 0.30, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to adjust either a or w such that w/a is between 0.22 and 0.30 for the purpose of adjusting the diffraction efficiency of the grating. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235.

14. Claims 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Derickson et al. in view of Kleeman et al.

Derickson et al. discloses a wavelength router (See Figure 1) for receiving, at an input port (See 5, 6 in Figure 1), light (See 13 in Figure 1) having a plurality of spectral bands and directing subsets of the spectral bands to respective ones of a plurality of output ports (See 4 in Figure 1), the wavelength router comprising a free-space optical train (See 3, 14, 16, 18 in Figure 1) disposed between the input port and the output ports providing optical paths for routing the spectral bands, the optical train including a reflective lamellar diffraction grating (See 14 in Figure 1) disposed to intercept light traveling from the input port. Derickson et al. lacks the reflective lamellar diffraction grating having an arrangement of generally rectangular protrusions spaced along a substrate such that $h/a > 0.5$ and $w/a < 0.5$. However, Kleeman et al. teaches the lamellar reflection diffraction grating as set forth above in Claims 1, 4, 7, 9, 12, 15, and 17-19. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the lamellar reflection diffraction grating of Kleeman et al. for the diffraction grating in the wavelength router of Derickson et al. One would have been

motivated to do this to provide a diffracting element that exhibits very high diffraction efficiency.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5828492 to Moser et al.

Moser et al is being cited to evidence lamellar diffraction gratings similar to those as disclosed by Kleeman et al., but usable as a dispersing element in a Fourier Transform interferometer.

U.S. Patent No. 6191890 to Baets et al.

Baets et al. is being cited to evidence adjusting the various physical parameters of lamellar diffraction gratings (i.e. grating pitch/period, grating height, grating width, etc.) such that polarization properties of the diffracted light may be optimized.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 703-305-4007. The examiner can normally be reached on M-F 8:30 AM - 5 PM.

The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Arnel C. Lavarias
January 28, 2003

